Title (en)

3D OBJECT POSITION AND POSE ESTIMATION

Title (de)

POSITIONS- UND LAGEBESTIMMUNG VON 3D OBJEKTEN

Title (fr)

ESTIMATION DE POSITION ET DE POSE DES OBJECTS 3D

Publication

EP 2927844 A1 20151007 (DE)

Application

EP 15162178 A 20150401

Priority

DE 102014005181 A 20140403

Abstract (en)

[origin: CA2887208A1] In a method for position and location determination of objects, particularly of uncooperative objects, a 3D sensor delivers data of the target object, which are compared with the data of the target object stored in a model database and are used both for an initial position and location estimation and for a subsequent more accurate position and location estimation of the target object. The 3D sensor, which is preferably a LIDAR, delivers the data relating to a sensor coordinate system in the form of a 3D point cloud, which is converted to a depth image, in which each pixel receives a grey value, which corresponds to a depth within a cuboid surrounding the target object. The method for initial position and location estimation is in this case based on 2D template matching and is termed 3D template matching. Due to the use of depth data, three of six degrees of freedom can be eliminated, so that a robust and fast method for initial position and location estimation results.

Abstract (de)

Bei einem Verfahren zur Positions- und Lagebestimmung von Objekten, insbesondere von unkooperativen Objekten, liefert ein 3D-Sensor Daten des Zielobjektes, die mit den in einer Modelldatenbank gespeicherten Daten des Zielobjektes verglichen werden und die sowohl für eine initiale Positions- und Lageschätzung als auch für eine nachgeschaltete genauere Positions- und Lageschätzung des Zielobjektes verwendet werden. Der 3D-Sensor, bei dem es sich vorzugsweise um ein LIDAR handelt, liefert die Daten bezüglich eines Sensorkoordinatensystems in Form einer 3D-Punktwolke, die zu einem Tiefenbild umgerechnet wird, in dem jeder Pixel einen Grauwert erhält, der einer Tiefe innerhalb eines umgebenden Quaders um das Zielobjekt entspricht. Die Methode zur initialen Positions- und Lageschätzung ist dabei an das 2D-Template-Matching angelehnt und wird als 3D-template-Matching bezeichnet. Durch die Verwendung von Tiefendaten lassen sich drei von sechs Freiheitsgraden eliminieren, so dass ein robustes und schnelles Verfahren zur initialen Positions- und Lageschätzung resultiert.

IPC 8 full level

G06V 10/764 (2022.01)

CPC (source: EP RU US)

G06F 18/24133 (2023.01 - US); **G06T 7/251** (2017.01 - EP US); **G06V 10/764** (2022.01 - EP US); **G06V 20/64** (2022.01 - EP US); **H04N 13/204** (2018.05 - EP US); **H04N 13/275** (2018.05 - EP US); G01S 17/89 (2013.01 - RU); G06T 2200/04 (2013.01 - EP US); G06T 2207/10016 (2013.01 - EP US); G06T 2207/10028 (2013.01 - EP US)

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DOCDB simple family (application)

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